

A NEW SPECIES OF *CHACEON* FROM NEW ZEALAND (CRUSTACEA: DECAPODA: GERYONIDAE)

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Abstract.—*Chaceon yaldwyni*, new species, is described from material collected off New Zealand in 1040–1045 and 1228–1276 m. It is the second species from the central Pacific characterized by laterally compressed dactyli on the walking legs. It differs from the other species known from the area, *Chaceon bicolor* Manning & Holthuis, 1989, by the slenderness of its legs in combination with characters of leg spinulation.

Among material of the commercially important crab genus *Chaceon* taken in New Zealand waters are two specimens, one from northeast of the Chatham Islands and the second from deeper water east of the North Island, that represent an undescribed species, characterized below. The holotype and paratype have been deposited in the National Museum of New Zealand (NMNZ).

Abbreviations used in the account below include cb for carapace width, including lateral spines, cl for carapace length on the midline, P5 for fifth pereopod, and FV for Fishing Vessel.

Chaceon yaldwyni, new species

Figs. 1–3

“second species.”—Webber et al., 1990:10.

Material.—New Zealand: Northeast of Chatham Islands, 43°40.4'S, 174°09.6'W to 43°26.6'S, 174°05.5'W, 1040–1045 m, leg. Henry Kavale, FV *Oyang 86*, Sta. 33, 14 Apr 1988: 1 ♂, holotype (NMNZ Cr. 6048).—Off Portland Island, Mahia Peninsula, 39°51.9'S, 177°55.3'E to 39°48.9'S, 177°55.6'E, 1228–1276 m, leg. Alan Hart, FV *Willwatch*, Sta. WIL/163/89, 19 Oct 1989: 1 ♀, paratype (NMNZ Cr. 6468).

Diagnosis.—A moderately large *Chaceon*, cl to 105 mm, cb to 128 mm, with well-developed anterolateral teeth on the carapace in adults and with laterally com-

pressed dactyli on the walking legs. Carapace 1.2–1.3 times broader than long, moderately inflated, distinctly convex from front to back, surface appearing smooth, pitted posterolaterally, not tuberculate. Median pair of frontal teeth short, rounded, separated by U-shaped emargination, medians extending further forward than laterals. Anterolateral teeth well-developed but not spiniform, second and fourth smaller than remainder. Distance from first to second tooth slightly less than distance from third to fourth tooth, distance from first to third less than distance from third to fifth. Suborbital tooth strong, visible in dorsal view, extending about to level of lateral frontal tooth; suborbital margin evenly curved, with some low, rounded tubercles. Cheliped: merus with sharp spine subdistally and with distal dorsal spine; carpus rough dorsally, with distal outer spine, denticulate anterior margin, and with strong, distinct inner spine; propodus roughened on dorsal and outer surfaces, with trace of distal dorsal spine on larger chela. Meri of posterior 3 walking legs with distal dorsal spine. Dactyli of walking legs laterally compressed, height at mid-length greater than width. P5: merus 5.11–5.25 times longer than high and 0.5–0.6 times cb, with distal dorsal spine; carpus with erect spinules dorsally; propodus distinctly longer than dactylus, 4.9 times longer than high.

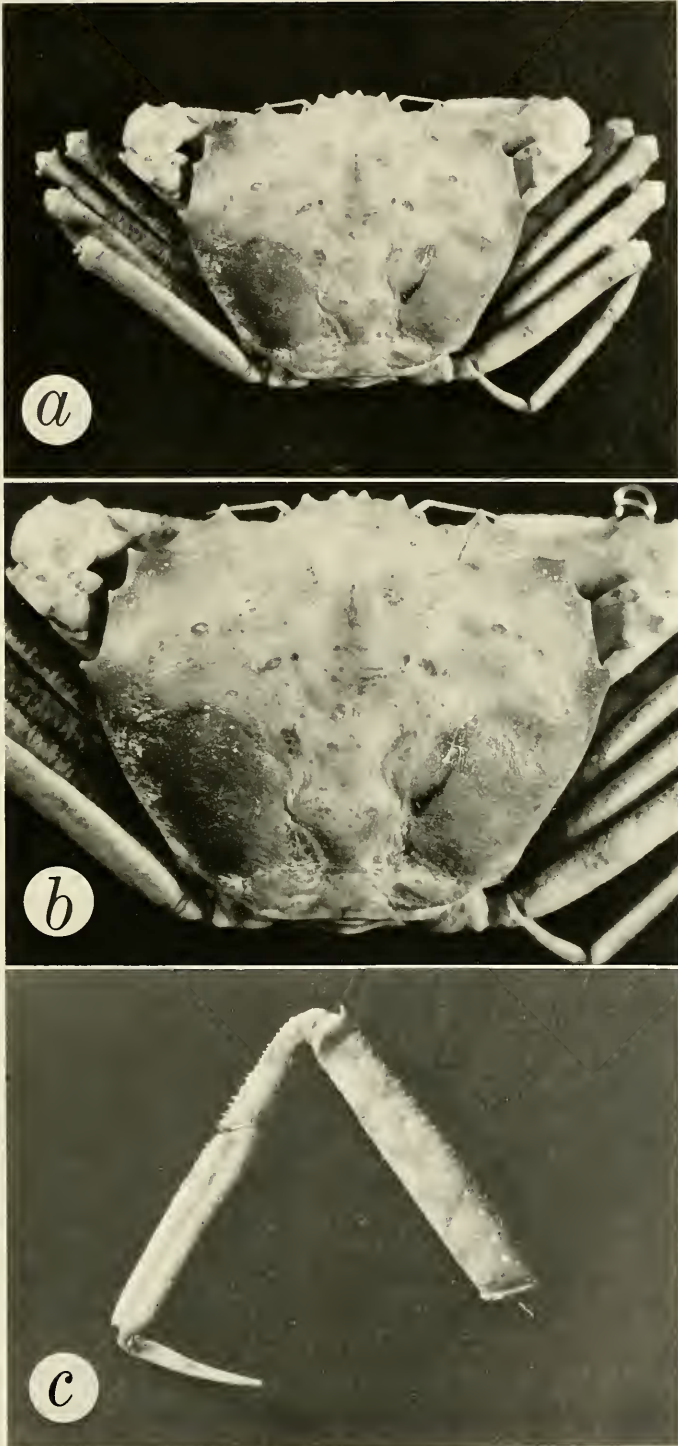


Fig. 1. *Chaceon yaldwyni*, male holotype, cb 128 mm: a, dorsal view; b, carapace; c, P5.

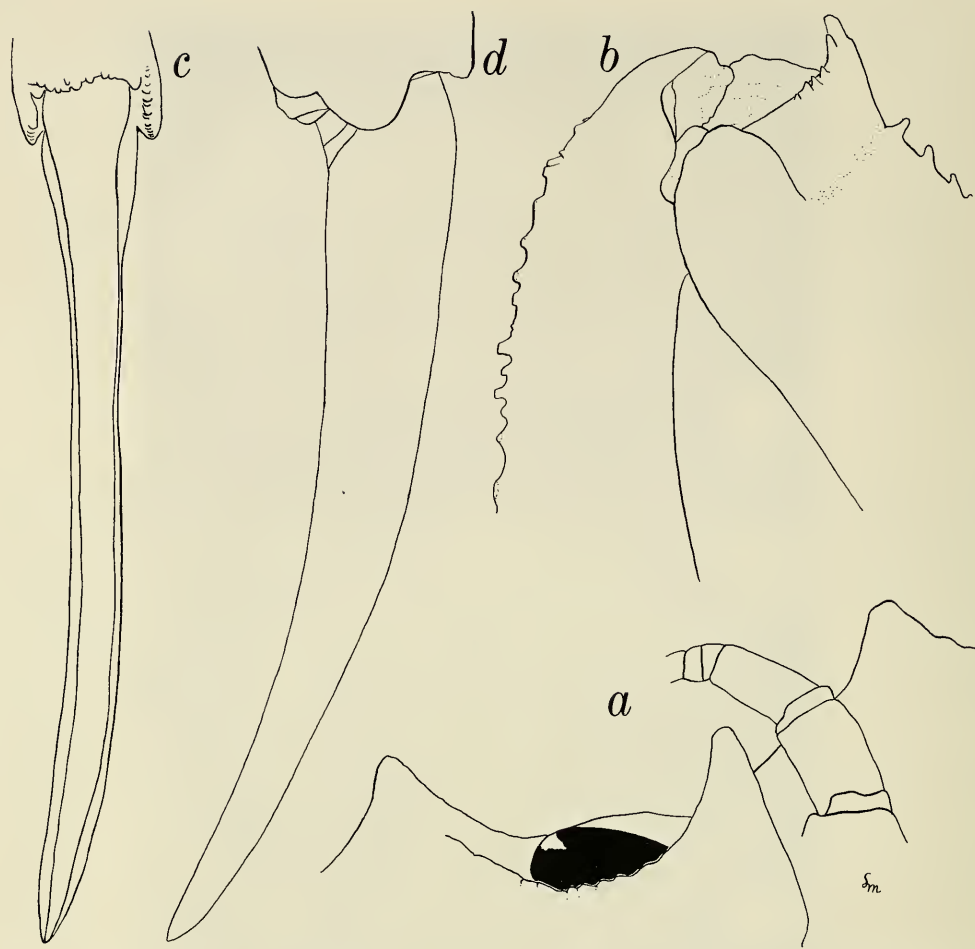


Fig. 2. *Chaceon yaldwyni*, male holotype, cl 128 mm, cb 128 mm: a, ventral view of orbit; b, merocarpal articulation of P5; c, dactylus of P5, dorsal view; d, dactylus of P5, posterior view.

Size.—Male holotype, cl 105 mm, cb 128 mm; female paratype, cl 72 mm, cb 92 mm.

Color.—The carapace of both specimens, when fresh, was a fairly uniform yellowish-red, in contrast to *C. bicolor*, in which, despite its name, the color ranges from a uniform tan to varying shades of purple forming a distinctive pattern on the carapace (see color figures of *C. bicolor* in Sakai (1978:pl. 2, fig. D).

Remarks.—Manning & Holthuis (1989: 75) listed five species of *Chaceon* known from the Indo-West Pacific region, two from the Pacific Ocean, three from the Indian

Ocean. Three of these species resemble *C. yaldwyni* in having laterally compressed dactyli on the walking legs: *C. bicolor* Manning & Holthuis (1989) from the central and southwestern Pacific, *C. crosnieri* Manning & Holthuis (1989) from Madagascar, and *C. paulensis* (Chun) (1903) from Amsterdam Island, southern Indian Ocean.

Chaceon yaldwyni resembles both *C. crosnieri* and *C. paulensis* in having distinct meral spines on the walking legs. It further resembles *C. crosnieri* in having the carapace, especially the protogastric regions, distinctly inflated, so that the carapace is

arched in lateral view; the carapace is much more inflated dorsally in *C. crosnieri* than in *C. yaldwyni*.

Chaceon yaldwyni differs from *C. crosnieri* in having more strongly developed anterolateral spines on the carapace and longer walking legs, with a line of erect spinules on the carpus.

This new species differs from *C. paulensis* in having the carapace much more inflated and in having much shorter anterolateral spines on the carapace. In *C. paulensis* the second and fourth anterolateral spines are well developed in adults, whereas in *C. yaldwyni* they are reduced in relation to the other anterolateral spines.

In the New Zealand region, *C. bicolor* is the more commonly found species of *Chaceon*. It is known from east and northeast of the North Island (Webber et al. 1990), whereas *C. yaldwyni* is only known at present from two areas, in one of which *C. bicolor* also occurs, although at shallower depths. *Chaceon yaldwyni* differs from *C. bicolor* principally in having quite strikingly slender legs in relation to body size and with strong carapace spines (although such spines have their counterparts in some specimens of *C. bicolor*, also, particularly in very young specimens tentatively identified with *C. bicolor*). Measurements of the proportions of the propodus of the walking legs give an index of this slenderness which can serve as a basis of comparison of the two species of *Chaceon* known from New Zealand waters.

A linear regression analysis of the length/height ratio of the propodus of P5 on carapace length for a total sample of 25 specimens of *Chaceon* available to us gave a low positive correlation coefficient (r) of 0.174. In contrast, omitting the two specimens of *C. yaldwyni* with the distinctly higher length/height ratios, the analysis yielded a high positive correlation coefficient of 0.775 (Fig. 3). The analysis includes all adult specimens previously determined as *C. bicolor*.

A comparison of the means of the P5 length/height ratios gave a t value of 3.879.

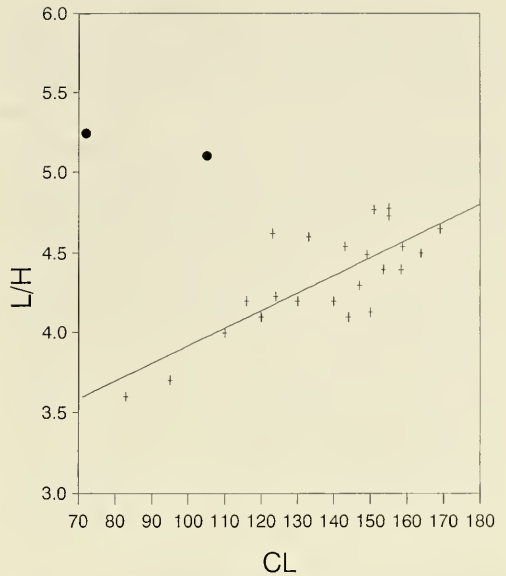


Fig. 3. Length/height ratio (L/H) of propodus of fifth leg (P5) in relation to carapace length (CL) in *Chaceon bicolor* (+) and *C. yaldwyni* (●); regression line applies to *C. bicolor* only.

For 23 degrees of freedom, the probability of obtaining a value of t greater than 2.807 is 0.01. Hence, the difference between the means is judged to be significant at the 1% level. In other words, the observed difference in propodus slenderness reflects, 99% of the time, a real difference between *C. bicolor* ($n = 23$) and *C. yaldwyni* ($n = 2$) so far as statistical discrimination based on the small sample sizes allows.

Chaceon yaldwyni also appears to differ from *C. bicolor* in having much more strongly developed anterolateral spines on the carapace, a longer, sharper suborbital tooth, and in having distinct distal dorsal spines on the meri of the walking legs in the adult. Meral spines are present in juveniles from New Caledonia identified with *C. bicolor* by Manning & Holthuis (1989); these juveniles, however, might well belong to *C. yaldwyni* or even another species rather than to *C. bicolor*, as they were not taken together with *C. bicolor* but in deeper water near areas where *C. bicolor* was collected. How-

ever, *C. bicolor* shows variability in its P5 distal meral spines, which, so far as New Zealand specimens are concerned, can range from mere protuberances to distinct low spines. Similarly, the dorsal margin of the carpus of P5 may vary from being quite smooth to bearing low spinules. These features certainly are much more pronounced in both of our specimens of *C. yaldwyni*.

It would be useful to be able to distinguish smaller *C. bicolor* from *C. yaldwyni* of the same size, but only two of the 23 specimens of *C. bicolor* available to us have carapace lengths of less than 100 mm. With only two specimens of *C. yaldwyni* so far known, it is hardly valid to attempt to establish any limits for its population mean in comparison with the mean of the sample. However, the limits for the population mean of the length/height ratios of the P5 propodus, the measure of leg slenderness, derived from a sample of 23 *C. bicolor* at the 95% confidence level ($P = 0.05$) is 4.206 to 4.467 (mean 4.337). For *C. yaldwyni* such a limit is 4.293 to 6.07. The specimens of *C. bicolor* closest in size to the known *C. yaldwyni* have cl and length/height ratio of the P5 propodus of 83 mm and 3.6, 95 mm and 3.7, and 110 mm and 4.0 whereas in *C. yaldwyni* these values are 72 mm and 5.25 and 105 mm and 5.11. It might be expected, then, that smaller *C. bicolor* will be distinguishable by having proportionately stouter legs, in addition to a variable degree of conspicuousness of the carpal spinules, the distal meral spine, and the compression of the dactylus on the walking legs.

So far as taxonomic discrimination is concerned, the two populations of *Chaceon* found in New Zealand waters can be distinguished at the species level, even if some subjectivity may be needed in the determination of smaller individuals of *C. bicolor* in New Zealand using the range of morphological diagnostic criteria proposed by us.

The genus *Chaceon* now comprises 22 species. Manning & Holthuis (1989) listed

19 nominal species, and subsequently two other species have been named, *Chaceon chilensis* Chirino-Gálvez & Manning (1989), from Chile, and *C. ramosae* Manning, Tavares, & Albuquerque (1989), from Brazil.

The female paratype of *C. yaldwyni*, cl 72 mm, cb 92 mm, has enlarged, open vulvae with slightly blackened edges and longitudinal markings posteriorly consistent with the abrasive action of male pleopods. Size at sexual maturity might possibly be further evidence for the distinctness of *C. yaldwyni*, although, in the case of the West African *C. maritae* (Manning & Holthuis) (1981), Melville-Smith (1989) has suggested that mature females may moult more than once and continue to grow extremely slowly.

Name.—This species is named for John C. Yaldwyn, recently retired Director of the National Museum of New Zealand.

Distribution.—Known only from New Zealand.

Acknowledgments

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Note added in proof: A reference to *Chaceon yaldwyni* (as *Chaceon* sp.) taken northeast of the Chatham Rise in 962 meters came to our attention while this manuscript was in proof. The citation of this species was in:

1990. Fishes collected by the R/V Shinkai Maru around New Zealand. Japan Marine Fishery Resource Center, Tokyo, 410 pp.

The account of the crustaceans in this volume apparently is by M. Takeda, but the pagination of Takeda's article is unknown to us.

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